

# DISTINGUISHED LECTURER SERIES

THE INSTITUTE FOR SYSTEMS RESEARCH



Monday, October 20 and Tuesday, October 21

## Automated Synthesis of High-Performance Planners and Schedulers

Douglas Smith, Kestrel Institute, Palo Alto, Calif.

Program synthesis is the automated generation of code from formal specifications. We have explored a variety of approaches to applying synthesis technology to the production of high-performance planners and schedulers. Our current thinking is embodied in a generator called Planware II which uses a domain-specific specification formalism based on state machines to model complex resource systems. The state machines, better thought of as activity machines, include constraints on activities and their transitions, as well as services that model the interaction between resources. Program schemas are instantiated to yield fast, customized search and propagation code. This talk will survey our technological progress on synthesizing scheduling algorithms and the various applications that we have developed.

### Next lecture in the series

Thursday, December 18  
**New Perspective on Wolfram's  
'New Kind of Science'**

Dr. Leon O. Chua  
University of California, Berkeley.

**Current information:**  
[www.isr.umd.edu/ISR/  
about/dls.html](http://www.isr.umd.edu/ISR/about/dls.html)

**Questions?**  
Call 301-405-6615

### Biography

Dr. Douglas Smith has been with the Kestrel Institute since August 1984. He has taught a graduate course on "Software Development by Refinement" at Stanford University since 1986. He received his Ph.D. degree in Computer Science from Duke University in 1979. Prior to joining Kestrel he held academic positions at the Naval Postgraduate School and managed the basic research program in Artificial Intelligence at the Office of Naval Research in Arlington, Va. Dr. Smith is a Fellow of the American Association of Artificial Intelligence (AAAI). He was Chairman of IFIP Working Group 2.1 on Algorithmic Languages and Calculi from 1993 through 1999.

Dr. Smith's main research interest has been formalizing and mechanizing software development. Related interests include algorithm design, automated deduction, program optimization, data structure design, computational complexity, models of software systems and their design and evolution, and inductive inference. He is principally responsible for the development of KIDS (Kestrel Interactive Development System), a state-of-the-art formal software development environment. KIDS has been used to develop algorithms for problems from a wide range of application domains including scheduling, mathematical programming, combinatorial design, sorting and searching, pattern matching, computational geometry, VLSI routing, and air traffic control.

### Date and time

#### Lecture

Monday, October 20  
3:30 p.m.  
1115 Computer Science Instructional Center

#### Roundtable discussion

Tuesday, October 21  
11:00 a.m.  
2168 A.V. Williams Building

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### Host

Professor Dana Nau